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## HIGH SPIN STUDIES WITH LARGE ARRAYS IN EUROPE: TRIAXIALITY, CHIRAL BANDS AND SUPERDEFORMATION

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The recent results obtained with the EUROBALL and GASP arrays in the  $A=130$  mass region will be reviewed, emphasizing the discovery of excited highly-deformed bands and their decay-out, the discovery of chiral doublet bands in Pr nuclei and of stable triaxial bands in Nd nuclei close to the  $N=82$  shell closure, as well as the latest results on superdeformation. The extended studies of the highly-deformed bands in Nd nuclei lead to the observation of the linking transitions over a series of six nuclei, and therefore to the determination of the excitation energy, spin and parity of the states. This also allowed to estimate the neutron pairing strength in the second well from the odd-even mass differences, giving the first experimental indication that the gap value in the highly-deformed configurations is reduced by a factor of 2 with respect to the value for the normal-deformed ground states [1]. Another topic of interest in  $A\sim 130$  nuclei in the recent years was the chirality in triaxial rotating nuclei predicted theoretically by Frauendorf [2]. This brought the odd-odd Pr nuclei and their neighbours into the focus of experimental studies in various laboratories around the world, with one of the best examples being  $^{134}\text{Pr}$  [3]. The status of the search of chiral bands at high spins in odd-even and even-even nuclei will be discussed. Very recently, exciting results were obtained from the study of the highest spin states in nuclei close to the  $N=82$  shell closure: the observation of stable triaxiality up to the highest observed spins in  $^{138}\text{Nd}$ ,  $^{139}\text{Nd}$  [4] and the observation of the superdeformation in  $^{140}\text{Nd}$  [5]. These achievements lead to the understanding of the evolution of the superdeformation phenomenon along the periodic table, establishing for the first time a "bridge" between two islands of superdeformation, the  $A=130$  and  $A=150$  mass regions. Finally, the new experimental facilities for gamma spectroscopy in Europe (CLARA+PRISMA at LNL and RISING at GSI) will be presented, together with the experiments that are intended to be performed in the near future.

1. S. Perries et al., Phys. Rev. C60 (1999) 064313.
2. S. Frauendorf and J. Meng, Nucl. Phys. A617 (1997) 131.
3. C.M. Petrache et al., Nucl. Phys. A597 (1996) 106.
4. C.M. Petrache et al., Phys. Rev. C61 (2000) 011305.
5. to be published.